Aug. 4, 1953 J. S. GIFFORD 2,647,547

SHINGLE SURFACING MACHINE

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Fig. 1

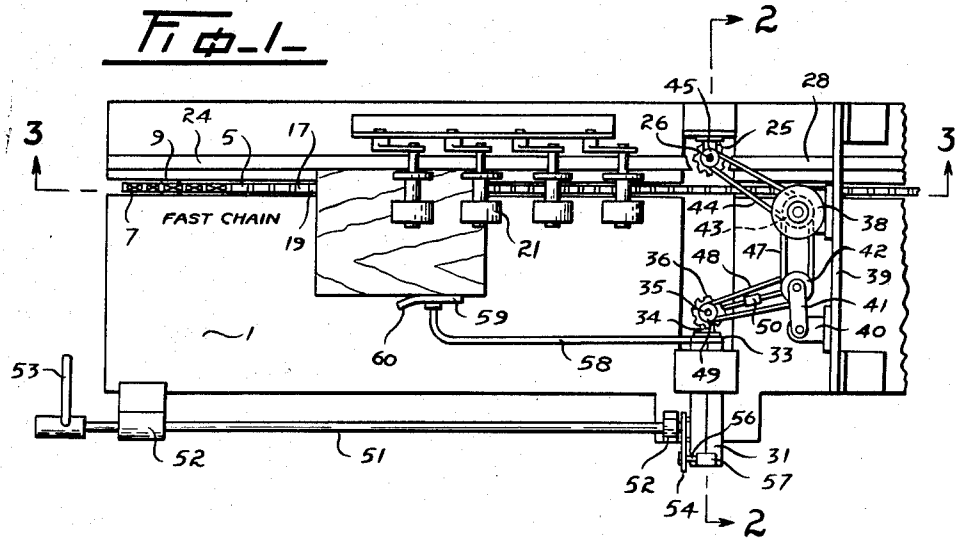


Fig. 6

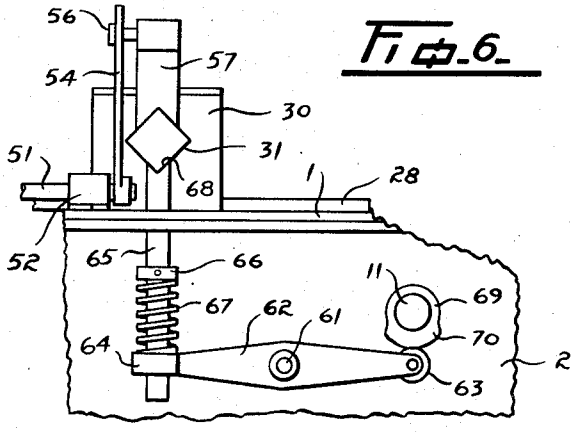
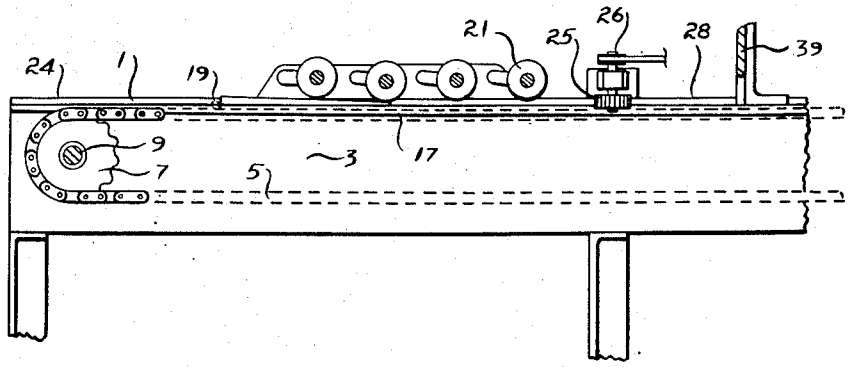


Fig. 3



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Fig. 2.

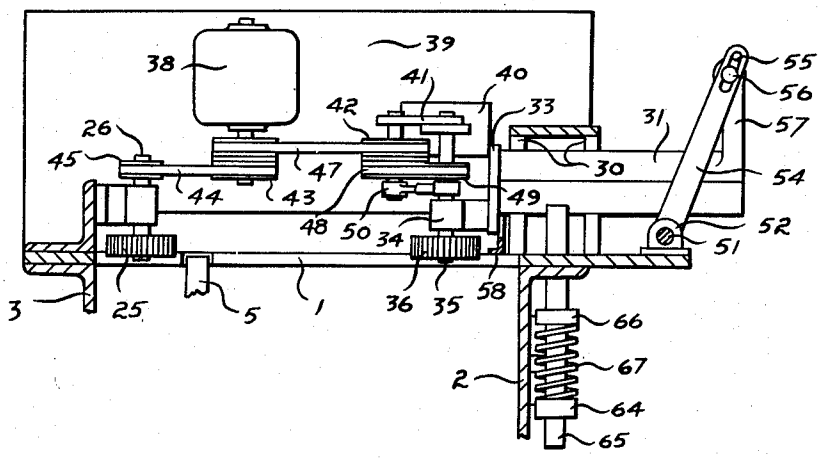
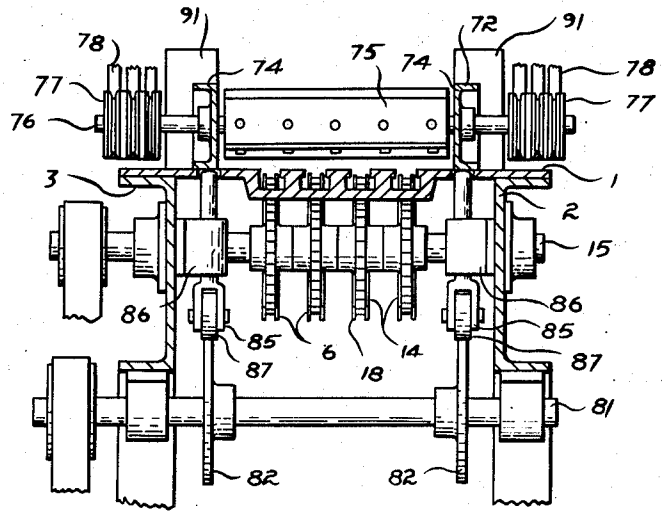


Fig. 7.



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Fig. 1A.

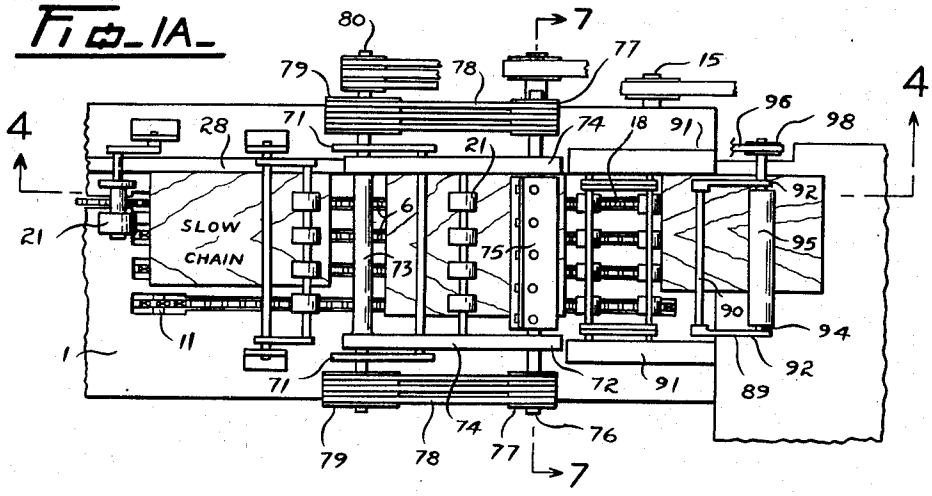


Fig. 5.

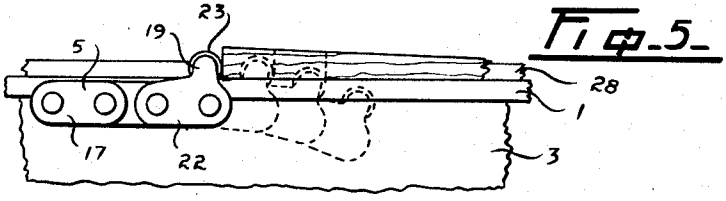
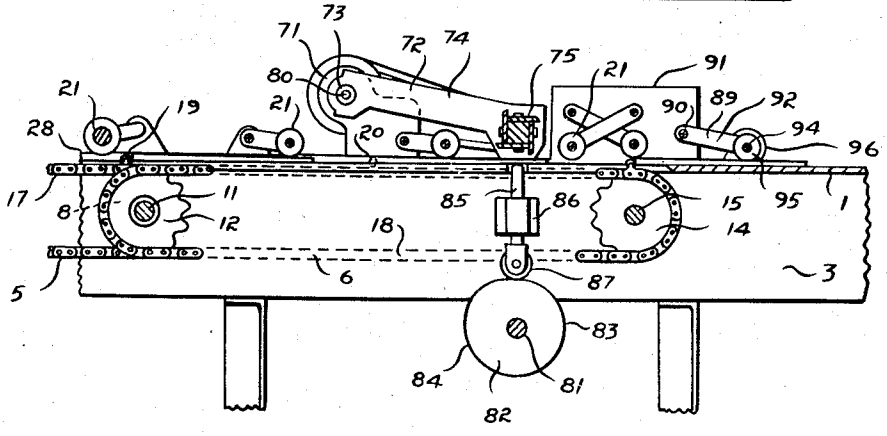


Fig. 4.



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SHINGLE SURFACING MACHINE

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4 Claims. (Cl. 144—13)

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My invention relates to improvements in shingle surfacing machines.

Shingles processed on machines provided with one or more planer heads, are apt to vary somewhat in thickness. If a shingle is a very wide one, the side edges will, after face surfacing, be substantially alike, but if the shingle is narrow, then one side will probably be perceptibly thinner than the other, so that when a building is finished any shingled wall surface may look irregular and present undesirable patches of shade or highlight on account of this irregularity.

Where a constant speed is provided for feeding shingles to the side trimmers and to the surface trimming device, or cutter head, the feeding is too slow for quantity production or the speed of the shingle under the cutter head is too fast to make a smooth surface cut. It is therefore an object to provide an initial feed conveyor to run at high speed to take the shingles past the side cutters and one to run at a slower speed to pass it under the groover head. In other words, the time taken for each shingle to travel along the slow chain is the same as that taken in placing a shingle on the bed of the machine and moving it forwardly past the first and the second side trimmers. By this means the number of cuts made by the several knives of the cutter head is twice as great as that on the conventional machines and obviously the spaces between cuts are much closer, so that the smoothness of the finished shingle is greater than that of shingles heretofore offered to the trade. The above and other objects will appear as the specification proceeds.

Referring to the drawings:

Figures 1 and 1A represent plan views of the side trimming and surfacing parts, respectively, of the invention.

Figure 2 is an enlarged sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a longitudinal sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a longitudinal sectional view taken on the line 4—4 of Figure 1A.

Figure 5 is an elevational view of a fast chain flight showing its action on a shingle passing from a fast chain to a slow chain.

Figure 6 is an enlarged sectional view showing the brake for the movable trimmer.

Figure 7 is an enlarged transverse sectional view taken on the line 7—7 of Figure 1A and showing the "slow chain" drive to the planer head.

In the drawings like characters of reference indicate corresponding parts in each figure.

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The numeral 1 indicates a bed supported on longitudinal side frame members 2 and 3. The bed 1 is grooved to accommodate a plurality of endless conveyor chains 5 and 6. The chain 5 is driven at a high rate of speed and the chains 6 are driven at a slow speed and are indicated in Figures 1 and 1A as "fast chains" and "slow chains." The fast chain serves to move a shingle from its initial position upon the bed past the devices where its side edges are trimmed, and the slow chains serve to move the shingle past the surfacing means. The fast chain 5 passes around sprockets 7 and 8, the sprocket 7 being mounted upon a transverse driven shaft 9, and the sprocket 8 is freely journalled upon a shaft 11. The shaft 11 is fitted with sprockets 12, upon which sprockets the slow chains 6 are trained, the slow chains pass around sprockets 14 at the forward end of their run. The sprockets 14 are fitted upon a driven shaft 15. The conveyor formed by the single fast chain 5 will be indicated generally by the numeral 17 and that formed by the plurality of slow chains 6 will be indicated by the numeral 18.

The conveyor chains 5 and 6 are provided in the usual way with flights 19 and 20 respectively, which follow up the shingles and urge them against the various trimming devices, and pressure rolls 21 are mounted from the sides of the bed 1, to bear upon the shingles as they are severally carried through the machine. The pressure rolls are of any preferred type and may be serrated upon their peripheries or otherwise as desired. In order that the flights 19 of the fast chain 5 do not damage the butt end of a shingle when said flight is dipping below the bed, said flights are provided with vertical side members 22 between which transverse rollers 23 are mounted. As a flight 19 is tipping to pass around the sprocket 8 the roller 23 engages the butt end of the single and moves it horizontally along the table at a greater speed than that at which it was being urged when the flight was travelling on the level and the roller finally rolls down the butt end of the shingle without splitting any end grain thereof or doing any damage to said shingle during its passage from the fast to the slow chains.

Disposed lengthwise of the bed 1 is a fence 24 against which all shingles are placed when setting them on the bed. This fence terminates at or near a trimmer 25 which is mounted on a vertically journalled shaft 26 disposed above the side frame member 3. A second fence 28 extends beyond the trimmer 25 and towards the rear end of the machine or to the right of Figure 1A.

Mounted to the right of the bed 1, see Figures

2 and 6, is a pair of slide bearings 30 in which a square shaft 31 is slidably mounted. The square shaft 31 is provided at its inner end with a face plate 33 carrying a vertical bearing 34, which bearing journals a shaft 35 having a rotary trimmer 36 at its lower end. The trimmers 25 and 36 are substantially similar to milling cutters and are adapted to trim the side edges of each shingle as it is carried along the table.

A motor 38 is mounted upon a frame 39 which extends across the bed 1, and on this frame a bracket 40 is mounted which is fitted with a swinging arm 41 and at the free end of said arm a pair of connected idler pulleys 42 are rotatably supported. The motor 38 is fitted with twin drive pulleys 43, one of which is connected by a V-belt 44 to a pulley 45 on the trimmer shaft 26 and the second of the twin pulleys 43 is connected by a V-belt 47 to one of the idler pulleys 42 and another V-belt 48 connects the second idler pulley 42 to a pulley 49 on the trimmer shaft 35. A radius rod 50 is provided to keep the belt 48 connecting one of the idler pulleys 42 and the pulley 49 suitably tight as the trimmer 36 is moved transversely of the bed from one position to another.

A rock shaft 51 is mounted in bearings 52 set adjacent the right side edge of the bed 1 as seen in Figure 2. One end of said rock shaft is fitted with a hand lever 53 and the opposite end is fitted with a crank 54 having a slot 55 at its free end through which a pin 56 extends into an upstanding arm 57 upon the outer end of the sliding shaft 31. Connected to the inner end of the shaft 31 is a light arm 58 which is movable either in contact with the bed or slightly above it, and is provided at its forward end with a contact shoe 59 having an outwardly curved end 60. By swinging the hand lever 53 to the left, the contact shoe 59 is moved across the bed 1 to the left as in Figure 1, to be engaged by a shingle passing along on the fast chain 5. The swing of the hand lever causes the trimmer 36 to move simultaneously with the shoe, so that when the shoe is stopped by the passing shingle, the trimmer is set to cut off a narrow strip from the right hand side of said shingle.

Pivotally mounted on a pin 61, see Figure 6, is a rocker arm 62 having a roller 63 at one end and a vertical eye 64 at the other end. Slidably mounted in the eye 64 of the rocker arm 62 is a vertical brake rod 65 which is provided with a stop collar 66, between which and the eye 64 is a coil spring 67. The rod 65 is transversely grooved at its upper end as at 68 to fit the underside of the sliding shaft 31.

Fitted upon one end of the shaft 11 is a cam 69 having a cam track 70, the cam makes substantially one-half revolution as a shingle is being carried under the trimmers 25 and 36 and its cam track 70 keeps the roller 63 of the rocker arm 62 depressed, and during that time, the grooved end 68 of the rod is held firmly up against the sliding shaft 31 to hold it and the trimmer 36 against endwise movement. Obviously as the cam turns, so that its cam track 70 recedes from the roller 63, the rod 65 drops back and releases the sliding shaft 31, so that the trimmer 36 and the contact shoe 59 may be moved to the right of the bed to await the arrival of another shingle on the fast chain 5 for gauging as to width.

A pair of brackets 71 are provided on opposite sides of the bed 1 in which is swingingly mounted a heavy torque bar frame 72 consisting of a tubular member 73 having integral therewith a pair of parallel arms 74, see Figures 1A and 4. A planer head 75 is rotatably mounted between the free ends of the arms 74 on a shaft 76. The shaft 76 is fitted with pulleys 77 which are driven by belts 78 from pulleys 79. The pulleys 79 are mounted upon a driven shaft 80 extending through the tubular member 73 and journalled in the brackets 71.

Mounted below the bed 1 is a transverse shaft 81, see Figure 4, which is driven in timed relation to the flights 20 of the slow chain conveyor 16. A cam 82 is secured upon each end of said shaft, both cams are alike and have a circular or non-operative peripheral edge portion 83 and a cam track 84 of progressively increasing radial projection. A pair of pins 85 are carried in guides 86 and are provided with rollers 87 which roll upon the cams 82. The pins 85 extend upwardly through the table 1 and engage the underside of the parallel arms 74 to support the planer head at slightly more than the thickness of the tip of the shingles. The cams 82 rotate one complete revolution as an interspace between two adjacent flights of the chains 6 pass the planer head, so that as each shingle passes beneath the planer head, said head is supported by the pins riding upon the edge portions 83 and the tip of the shingle can pass thereunder without being surfaced. When said shingle has passed a predetermined distance its surface will move into engagement with the planer head and the cam portion 84 will ride under the rollers 87, causing the pins to lift and the planer head to lift progressively as the thickness of the shingle increases under the planer head, so that the depth of each groove cut will remain constant throughout the grooved part of said shingle. The planer head being raised by the pins 85 adjacent both sides of the bed will remain parallel transversely to said bed and the passage of a narrow shingle will not allow the torque bar frame 72 to twist or spring or the planer head to tilt and produce a finished shingle with one edge thinner than another.

At the rear end of the bed 1 a torque arm 89 is mounted, which consists of a transverse shaft 90 suitably journalled in side members 91 and having secured thereto a pair of spaced arms 92. A shaft 94 is journalled between the free ends of the arms 92, which is fitted with a pressure roll 95 and is driven from a suitable source of power by a belt 96 driving a pulley 98 secured upon the outer end of the shaft.

In operation, shingles are placed one by one onto the fast chain 5 and are moved sidewise into contact with the fence 24, and as each shingle is engaged at its butt end by a flight 19, it will then be held down by passing under some of the pressure rolls 21 and can be released by the operator. As the shingle leaves the operator's left hand, he will with his right hand swing the hand lever 53 in an anticlockwise direction to move the side trimmer 36 into the path of the oncoming shingle. The contact shoe 59 of the arm 58 will lightly engage the side of the shingle, putting a slight resistance on the movement of the lever 53. During the passage of the shingle past the trimmers 25 and 36, the sliding shaft 31 and the trimmer 36 will be held against movement transversely of the bed 1 by the brake rod 65 which will then be held in raised position. As the shingle advances it passes between the side trimmers 25 and 36, which trim its side edges parallel to each other and continues on to the

slow chain with its left side in engagement with the fence 28. Simultaneously with the passing of a shingle under the trimmers, the hand lever 53 is moved back to the right to retract the shoe 59 in like direction and to permit the placing of another shingle upon the bed 1 for treatment. The shingle now on the slow chains will move under the planer head 75 where its upper surface is grooved. Since the planer head 75 is supported at both ends on pins 85, which rise and fall uniformly and simultaneously under the influence of the cams 82, both side edges of the shingles will be identical in width and taper, so that the finished shingles can be laid upon a surface and present no irregularity in the surface planes of the several abutting shingles. When a shingle is surfaced by the planer head 75, it is passed under the driven pressure roll 95 for delivery to a butt cut-off saw, not shown.

What I claim as my invention is:

1. A shingle machine comprising a bed, a fast and a slow conveyor extending along said bed, each of said conveyors having flights for engaging shingles to urge them along said bed, trimming devices mounted above said bed adapted to treat the side edges of a shingle as it is carried by the fast conveyor and a surfacing device extending transversely of said bed adapted to treat a surface of a shingle as it is carried by the slow conveyor.

2. A shingle machine comprising a bed, a fast and a slow conveyor extending along said bed, each of said conveyors having flights for engaging shingles to urge them along said bed, trimming devices mounted above said bed adapted to treat the side edges of a shingle as it is carried by the fast conveyor and a surfacing device extending transversely of said bed adapted to treat a surface of a shingle as it is carried by the slow conveyor, and means for urging each shingle away from the fast conveyor onto the slow conveyor at a higher speed than that of the fast conveyor.

3. A shingle machine comprising a bed, a plurality of endless conveyor chains having spaced flights for urging shingles along the bed, a pair of trimming devices mounted above said bed adapted to trim side edges of each shingle and a surface trimmer extending transversely of said bed adapted to treat a surface of the single, and means for reducing the speed of the shingle as it passes the surface trimmer below the speed at which it was travelling when it was passing the side trimmer.

4. In a shingle surfacing machine having a conveyor having spaced flights for urging shingles progressively along a bed, a pair of members carried upon each side of the bed, a driven shaft journalled transversely of the bed in said members, a pair of arms spaced apart and rigidly connected together for unitary movement, a planer shaft having a planer head journalled adjacent the free ends of the arms, said first mentioned shaft having a drive pulley adjacent each end, a driven pulley at each end of the planer shaft, said drive and driven pulleys being connected by endless belts, a cam shaft mounted transversely below the bed having a cam at each end, a vertical pin slidably mounted for reciprocation above each cam, each of said pins being adapted to engage the free end of an arm to raise and lower the planer head an equal distance whereby said head remains absolutely parallel to the bed irrespective of the width of a shingle passing under said planer head.

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